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10/606,699	06/26/2003	David Meiri	EMS-05901	5034

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EXAMINER

CAMPOS, YAIMA

ART UNIT

PAPER NUMBER

2185

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/606,699	Applicant(s) MEIRI ET AL.	
	Examiner Yaima Campos	Art Unit 2185	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/8/03</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The instant application having Application No. 10/606,699 has a total of 18 claims pending in the application; there are 2 independent claims and 16 dependent claims, all of which are ready for examination by the examiner.

#### **I. INFORMATION CONCERNING OATH/DECLARATION**

##### **Oath/Declaration**

2. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in 37 C.F.R. 1.63.

#### **II. STATUS OF CLAIM FOR PRIORITY IN THE APPLICATION**

As required by M.P.E.P. 201.14(c), acknowledgement is made of applicant's claim for priority based on applications filed on March 25, 2003 (CIP of 10/396,786; PAT 6,898,685).

#### **III. INFORMATION CONCERNING DRAWINGS**

##### **Drawings**

3. The applicant's drawings submitted are acceptable for examination purposes.

#### **IV. ACKNOWLEDGEMENT OF REFERENCES CITED BY APPLICANT**

4. As required by M.P.E.P. 609(C), the applicant's submission of the Information Disclosure Statement dated October 8, 2003 is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending. As required by

M.P.E.P 609 C(2), a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.

**V. OBJECTIONS TO THE SPECIFICATION**

**Specification Objections**

5. The specification is objected to because of the following informalities:
6. The word “nor” (page 2, line 1) appears to be a typographical error. It is believed this word should be “not” and has been treated as such for the rest of this Office action.
7. The word “acknowledge” (page 6, line 4) appears to be a typographical error. It is believed this word should be “acknowledgement” and has been treated as such for the rest of this Office action.
8. Applicant's cooperation is requested in correcting any other minor errors of which applicant may become aware in the specification.
9. Appropriate correction is required.

**Claim Objections**

10. **Claims 1-2, 4-6, 10-11 and 13-15** are objected to because of the following informalities:
11. As per **claims 1 and 10**, the limitation “a cache” (claim 1, line 5; claim 10, lines 4 and 7) should be changed to **–the cache–**.
12. As per **claims 1-2, 4-6, 10-11 and 13-15**, (claim 1, lines 6-9 and claim 10, lines 5-8) , it appears that data read from the remote storage device should be stored in the cache of the local storage device. Therefore, in (claim 1, lines 7 and 8; claim 2, lines 11 and 12; claim 4, lines 16 and 17; claim 5, lines 2 and 3; claim 6, lines 4; claim 10, lines 5 and 6; claim 11, lines 11 and 12;

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claim 13, lines 16 and 17; claim 14, lines 2 and 3; claim 15, line 4), --**the cache of**-- should be inserted before “the local storage device.”

13. As per **claims 4-5 and 13-14**, the words “correspond to of data” (page 58, line 17; page 59, line 3; page 60, line 16 and page 61, line 3) appear to contain a typographical error. It is believed these words should be **–correspond to data–** and have been treated as such for the rest of this office action.

14. Appropriate correction is required.

## **VI. REJECTIONS NOT BASED ON PRIOR ART**

### **a. DEFICIENCIES IN THE CLAIMED SUBJECT MATTER**

#### ***Claim Rejections - 35 USC § 101***

15. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

16. **Claims 10-18** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

17. As per **claims 10-18**, Applicant has claimed “computer software” in the preamble to claims 10-18; which implies that Applicant is claiming a system of software, per se, lacking the hardware necessary to realize any of the underlying functionality. Therefore, claims 10-18 are directed to non-statutory subject matter as computer programs, per se, i.e. the descriptions or expressions of the programs, are not physical “things.” They are neither computer components nor statutory processes, as they are not “acts” being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer

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program and other claimed elements of a computer, which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory.

18. Any claim not specifically addressed above, is being rejected as encompassing the deficiencies of a claim upon which it depends.

## **VII. REJECTIONS BASED ON PRIOR ART**

### ***Claim Rejections - 35 USC § 102***

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. **Claims 1, 6, 10, 15** are rejected under 35 U.S.C. 102(b) as being anticipated by Ofek (US 5,901,327).

21. As per **claims 1 and 10**, Ofek discloses “A method/(computer software) of using a local storage device to read desired data stored on a remote storage device that receives chunks of data from the local storage device, comprising:” [With respect to this limitation, Ofek discloses “a system and method for automatically providing and maintaining a copy or mirror of data stored at a location remote from the main or primary data storage device” (Column 1, lines 15-19) wherein “data is retrieved from a remote device through the host data processing

system” (Column 4, lines 55-56) and further explains that “the host 12 writes data to and reads data from the primary data storage system 14” (column 4, lines 62-63). Ofek also teaches; “The host central processing unit 212 can also be provided with optional host remote mirroring (RM) software 213 so that the data processing system can be configured and monitored from a user interface of the host central processing unit. Host application programs can also interface with the remote mirroring facility of the data storage systems 214, 246 via the optional host remote mirroring (RM) software 213” (Column 10, lines 2-9)] “if the desired data is entirely in a cache of the local storage device, the local storage device returning the data from the cache;” [With respect to this limitation, Ofek discloses that during a read access, “the channel adapter accesses the cache. If the data requested by the host is not in the cache, then the data is fetched by a disk adapter from disk storage in the data storage system, and loaded into the cache” (Column 14, lines 28-31)] “and if the desired data is not entirely in a cache of the local storage device, reading data from the remote storage device to the local storage device and the local storage device merging the data from the remote storage device with data from the local storage device at the local storage device” [With respect to this limitation, Ofek teaches that if data is not available in a local/primary volume, “a request for data access to a primary (R1) volume can be satisfied by obtaining the requested data from the secondary volume (R2) in the remote data storage system” (Column 14, lines 43-48). Ofek further explains maintaining log files which “may contain different version of data written to the same location or track in the dataset” (Column 29, lines 53-54) wherein “the log file is used to recover the data file by applying to the data file the changes recorded in the log file” (Column 30, lines 41-44) as “the primary data storage system performs

automatic recovery by copying the secondary volume to the primary volume” (Column 30, lines 48-50)].

22. As per claims 6 and 15, Ofek teaches “A method, according to claims 1 and 10,” [See rejection to claims 1 and 10 above] “wherein the data from the local storage area is merged on top of data from the remote storage area” [Ofek teaches this concept as having an “overwrite cache option” wherein “every single update to a record of a primary volume is not necessarily transmitted to the secondary volume, then a new version will overwrite this pending record in cache” (Column 39, lines 45-52) and also teaches that “Should one volume in the remote mirrored pair fail, the data storage system automatically uses the other volume without interruption” as “to perform maintenance activity on a remotely mirrored volume, the primary volume tracks all updates to its secondary volume and copies the updated tracks to the other volume” (Column 24, lines 48-67)].

**Claim Rejections - 35 USC § 103**

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

24. Claims 2, 7-9, 11 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek (US 5,901,327) in view of Pong et al. (US 6,880,045).

25. As per claims 2 and 11, Ofek discloses “A method, according to claims 1 and 10,” [See rejection to claims 1 and 10 above] and also teaches [maintaining log files which “may contain different version of data written to the same location or track in the dataset”



(Column 29, lines 53-54) wherein “the log file is used to recover the data file by applying to the data file the changes recorded in the log file” (Column 30, lines 41-44) as “the primary data storage system performs automatic recovery by copying the secondary volume to the primary volume” (Column 30, lines 48-50)] as having a temporary storage to keep data updates but fails to disclose expressly “prior to reading data from the remote storage device to the local storage device, creating a temporary storage area at the local storage device if there is data from the local storage device that is to be read.”

Pong teaches the concept of “prior to reading data from the remote storage device to the local storage device, creating a temporary storage area at the local storage device if there is data from the local storage device that is to be read” as [having a multi-processor computer system in which “when a node requires a copy of the memory block, it requests the memory block from its local, private cache. If the data is found, the memory access is resolved locally. Otherwise, a remote memory access is performed to the home node” (Column 1, lines 44-48); and further explains having a “requesting node 200” and a “home node 300” wherein “the requesting and home nodes have the same specified values in memory locations A, B, C. After an update it is possible that the local cache of the requesting node, may have the most recent values of location A, B and C” then “the home node has stale data copies in the home memory” so “the new values for locations A, B and C” are written to “a temporary buffer in the home node” wherein “the home node SCU (system control unit)” copies “the new values from the temporary buffer to the actual memory location for A, B and C in the memory” (Column 4, lines 1-25)].

Ofek (US 5,901,327) and Pong et al. (US 6,880,045) are analogous art because they are from the same field of endeavor of computer memory backup/accessing/control while maintaining data coherency.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the data backup/retrieval as taught by Ofek and further use a temporary memory area in addition to a cache to store data temporarily before merging/transferring this data to a main memory as taught by Pong.

The motivation for doing so would have been because Pong discloses that using a temporary memory buffer in addition to a cache to store data temporarily before merging/transferring this data to a main memory **[prevents data loss and maintains coherent data in a memory system (Column 3, lines 3-6) as “The old values of the affected memory locations of the home memory 312 are then copied into the temporary buffer 315 as indicated by arrow 256 to prevent their loss in case of a failure before the transaction is completed” (Figures 2, 3 and Column 4, lines 52-58); maintaining data coherency]**.

Therefore it would have been obvious to combine Pong et al. (US 6,880,045) and Ofek (US 5,901,327) to obtain the invention as specified in claims 2 and 11.

26. As per **claims 7 and 16**, Ofek discloses “A method, according to claims 1 and 10,” [See **rejection to claims 1 and 10 above**] and also teaches having a remote storage comprising a secondary data storage controller in which [**“The secondary data storage system controller 44 also includes cache memory 64 which receives data from channel adapter 54 and disk adapter 42, as well as disk adapter 66 which controls writing data to and from secondary storage device 48” (Column 6, lines 44-48)**] but fails to disclose expressly; “the remote storage

device allocating a temporary storage area in response to data to be read being stored in a cache slot of the remote storage device.”

Pong discloses the concept of “allocating a temporary storage area in response to data to be read being stored in a cache slot of the remote storage device” as **[having a multi-processor computer system in which “when a node requires a copy of the memory block, it requests the memory block from its local, private cache. If the data is found, the memory access is resolved locally. Otherwise, a remote memory access is performed to the home node”** (Column 1, lines 44-48); and explains having a “requesting node 200” and a “home node 300” wherein “the requesting and home nodes have the same specified values in memory locations A, B, C. After an update it is possible that the local cache of the requesting node, may have the most recent values of location A, B and C” then “the home node has stale data copies in the home memory” so “the new values for locations A, B and C” are written to “a temporary buffer in the home node” wherein “the home node SCU (system control unit)” copies “the new values from the temporary buffer to the actual memory location for A, B and C in the memory” (Column 4, lines 1-25)].

Ofek (US 5,901,327) and Pong et al. (US 6,880,045) are analogous art because they are from the same field of endeavor of computer memory backup/accessing/control while maintaining data coherency.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the data backup/retrieval as taught by Ofek and further use a temporary memory area in addition to a cache to store data temporarily before merging/transferring this data to a main memory as taught by Pong.

The motivation for doing so would have been because Pong discloses that using a temporary memory buffer in addition to a cache to store data temporarily before merging/transferring this data to a main memory **prevents data loss and maintains coherent data in a memory system (Column 3, lines 3-6)** as **“The old values of the affected memory locations of the home memory 312 are then copied into the temporary buffer 315 as indicated by arrow 256 to prevent their loss in case of a failure before the transaction is completed” (Figures 2, 3 and Column 4, lines 52-58); maintaining data coherency**].

Therefore it would have been obvious to combine Pong et al. (US 6,880,045) and Ofek (US 5,901,327) to obtain the invention as specified in claims 7 and 16.

27. As per **claims 8 and 17**, the combination of Ofek and Pong discloses “A method, according to claims 7 and 16,” [See rejection to claims 7 and 16 above] “further comprising: reading data from the disk of the remote storage area into the temporary storage area;” [With respect to this limitation, Pong discloses that when a backup operation is required **“The old values of the affected memory locations of the home memory 312 are then copied into the temporary buffer 315 as indicated by arrow 256 to prevent their loss in case of a failure before the transaction is completed” (Column 4, lines 52-68)**] “and merging the data to be read stored in the cache slot with data from a disk in the temporary storage area” [With respect to this limitation, Pong discloses **“After the new values are written into the home node memory 312, the home node 300, acknowledges with an "ack" signal as indicated by arrow 274 that all the new values have been successfully captured. Upon receiving the acknowledgement, the receiving node will issue a "request-to-commit" request as indicated by arrow 276. Finally, the home node SCU 310 acknowledges with a "commit" message**

along arrow 278 to indicate that the transaction has been completed” (Column 5, lines 3-11); as indicating that data has been merged].

28. As per claims 9 and 18, the combination of Ofek and Pong discloses “A method, according to claims 7 and 16 above,” [See rejection to claims 7 and 16 above] “further comprising: prior to the remote storage area determining if there is data to be read stored in a cache slot of the remote storage device, the remote storage device writing at least a portion of the data from at least one cache slot of the remote storage device to a disk of the remote storage device” [Ofek teaches this concept “The secondary data storage system controller 44 also includes cache memory 64 which receives data from channel adapter 54 and disk adapter 42, as well as a disk adapter 66 which controls writing data to and from secondary storage device 48” (Column 6, lines 44-48) as having a cache for temporary data storage before writing data to disk. Pong further discloses this concept as “The SCU (system control unit) 210 further contains a cache flushing engine (CFE) 220, shown in FIG. 2” (See figure 2 and Column 3, lines 53-54) as having means for flushing data from cache to a remote or “home memory”].

29. Claims 3-5 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ofek (US 5,901,327) and Pong et al. (US 6,880,045) as applied to claims 2, 7-9, 11 and 16-18 above, and further in view of Bodnar (US 6,012,063).

30. As per claims 3 and 12, the combination of Ofek and Pong discloses “A method, according to claims 2 and 11,” [See rejection to claims 2 and 11 above] but fails to disclose expressly that “the temporary storage area is a scratch slot.”

Bodnar teaches having a “temporary storage area” which “is a scratch slot” as [**“The volatile memory is a *scratch* memory, for storing temporary computation results” (Column 2, lines 13-14) and explains that this scratch memory is used “for providing work space for the operating system and applications” (Column 2, lines 15-16)].**

Ofek (US 5,901,327), Pong et al. (US 6,880,045) and Bodnar (US 6,012,063) are analogous art because they are from the same field of endeavor of computer memory backup/accessing/control/data transfers while maintaining data coherency.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the data backup/retrieval as taught by Ofek, use a temporary memory area in addition to a cache to store data temporarily before merging/transferring this data to a main memory as taught by Pong and further make this temporary memory area be “a scratch” slot as taught by Bodnar.

The motivation for doing so would have been because Bodnar teaches that temporarily saving data to a memory scratch area [**minimizes the number of data transfers in a computer system; therefore, speeding overall system execution time (Column 1, lines 56-63) as a temporary scratch area is used “for providing work space for the operating system and applications” (Column 2, lines 15-16)].**

Therefore it would have been obvious to combine Bodnar (US 6,012,063), Pong et al. (US 6,880,045) and Ofek (US 5,901,327) to obtain the invention as specified in claims 3 and 12.

31. As per **claims 4 and 13**, the combination of Ofek, Pong and Bodnar discloses “A method, according to claims 3 and 12,” [See rejection to claims 3 and 12 above] “further comprising: prior to creating a temporary storage area, locking slots of the local storage device that

correspond to of data from the local storage device that is to be read” [With respect to this limitation, Pong discloses that “a transaction performed on global data structures consists of a request phase, an execution phase and finally a commit phase” wherein “the LOCK operation defines where the original system state is and where the request phase begins” (Column 2, lines 41-43 and 48-50) as locking memory slots every time data is updated or moved].

32. As per claims 5 and 14, the combination of Ofek, Pong and Bodnar discloses “A method, according to claims 4 and 13,” [See rejection to claims 4 and 13 above] “further comprising: after merging the data, unlocking the slots of the local storage device that correspond to of data from the local storage device that is to be read” [With respect to this limitation, Pong discloses that “a transaction performed on global data structures consists of a request phase, an execution phase and finally a commit phase” wherein “the UNLOCK operation indicates where the update operations must commit. Specifically, before the LOCK is released, the home memory of A, B and C is either completely updated with the new values, or is unchanged” (Column 2, lines 41-43 and 50-54) as releasing a lock when data merged/overwritten].

#### **VIII. RELEVANT ART CITED BY THE EXAMINER**

33. The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant’s art and those arts considered reasonably pertinent to applicant’s disclosure. See MPEP 707.05(c).

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34. The following references teach storing/retrieving data from a local storage device to a remote storage device wherein a scratch area is created to store data temporarily before transferring this data to cache memory.

**U.S. PATENT NUMBER**

US 6,687,801

US 6,553,464

35. The following references teach data backup/retrieval.

**U.S. PATENT NUMBER**

US 6,609,183

US 6,615,320

36. The following reference teaches internal memory relocation wherein a local memory consists of a main memory, a cache and a scratchpad area.

US 2004/0034754

**IX. CLOSING COMMENTS**

**Conclusion**

**a. STATUS OF CLAIMS IN THE APPLICATION**

37. The following is a summary of the treatment and status of all claims in the application as recommended by M.P.E.P. 707.07(i):

**a(1) CLAIMS REJECTED IN THE APPLICATION**

38. Per the instant office action, claims 1-18 have received a first action on the merits and are subject of a first action non-final.



**b. DIRECTION OF FUTURE CORRESPONDENCES**

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571) 272-1232. The examiner can normally be reached on Monday to Friday 8:30 AM to 5:00 PM.

**IMPORTANT NOTE**

40. If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Donald Sparks, can be reached at the following telephone number: Area Code (571) 272-4201.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 28, 2006

Yaima Campos  
Examiner  
Art Unit 2185



**DONALD SPARKS**  
SUPERVISORY PATENT EXAMINER